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WARREN D. WILLIAMS
Riverside County Flood Control and Water Conservation District
(letter dated June 3, 2004)

Comment 1

Because of insufficient data, several conservative assumptions were made in developing the TMDLs, leading to recommendations for unnecessarily stringent numeric targets.

Staff Response

The best available data were used to develop the recommended TMDLs, including the numeric targets. Because of the uncertainty resulting from insufficient data, conservative assumptions were used in the development of the TMDLs and constitute an implicit Margin of Safety (MOS). A MOS is a requisite component of the TMDL. Data deficiencies are recognized in the TMDL report and are reflected in the schedules recommended for compliance with both the interim and final numeric targets. As additional data are collected, including consideration of the effects of ongoing and proposed projects to address the eutrophication problems, a more robust uncertainty analysis can be conducted and the MOS and TMDLs can be adjusted as appropriate. This includes review and refinement of the numeric targets and the load and wasteload allocations established to meet the targets. The proposed compliance schedules allow ample time for these analyses.

The proposed numeric targets for the Lake Elsinore and Canyon Lake nutrient TMDLs were selected based on best professional judgment of the levels necessary to implement existing water quality standards, that is, to protect beneficial uses and meet both narrative and numeric water quality objectives established in the Basin Plan. This approach is consistent with US EPA guidance that numeric targets should be based on the existing water quality standards. It is also consistent with the inherent purpose and mandate of the TMDLs, which is to achieve those standards. For Inland Surface Waters (including both Lake Elsinore and Canyon Lake), the Basin Plan (1995) specifies that "Waste discharges shall not contribute to excessive algal growth in receiving waters." In deriving the proposed numeric targets for Lake Elsinore, staff selected a time period when Lake Elsinore did not experience severe algal blooms or fish kills as a reference state for the Lake. It is not certain, however, that all affected beneficial uses (Warmwater aquatic habitat, Wildlife, Body-contact and non-body contact recreation) were protected by the nutrient levels measured during this reference period. Therefore staff took a conservative approach by selecting the lower 25th percentile of the phosphorus concentrations measured during this period. Again, this and other assumptions used in the formulation of the proposed TMDLs are subject to future review and revision, if it is warranted.

Comment 2

The proposed interim and final TMDL targets for total phosphorus and total nitrogen are not realistic. Compliance with these targets is technically and fiscally infeasible. The targets are lower than [more stringent than] the minimum irreducible concentrations that can be achieved based on current common treatment control technologies for stormwater. The interim and final targets for the wastewater treatment plants are significantly higher than the lake numeric targets and are more in line with the irreducible concentrations. It is unreasonable to suppose that stormwater could meet the proposed targets when advanced wastewater treatment plants cannot do so. The wastewater and stormwater

BMP technologies best capable of achieving the proposed TMDL numeric targets are expensive to implement and are only fiscally feasible for treating small volumes of runoff. These technologies are neither physically nor fiscally feasible for treatment of large volumes of stormwater.

Staff Response

First, a clarification of terms is appropriate. The proposed interim and final numeric targets in the TMDLs are the goals for the receiving waters, while wasteload and load allocations pertain to nutrient inputs from individual sources, such as stormwater runoff. The purpose of these allocations is to assure that, cumulatively, the numeric targets will be met. The District's analysis focuses on the numeric targets but does not directly address the wasteload allocations for stormwater as they are expressed in the proposed TMDLs, i.e., as kg/yr, based on a 10 year running average, with compliance to be achieved by 2015 (interim) and 2020 (final). Evaluations of cost and technical feasibility should take these averaging and compliance time frames into account.

The District's comments and analysis (e.g., the tables on pages 3 and 4 of the comment letter) regarding fiscal and technical feasibility appear to be predicated on the assumption that the only means of compliance with the "numeric targets" (more accurately, with wasteload allocations needed to implement the numeric targets) is treatment of stormwater to achieve the requisite nutrient input reductions. Staff believes that this is not the case. First, evidence elsewhere (e.g., the Newport Bay watershed) demonstrates that BMPs such as source control can result in substantial pollutant reductions. It is likely that additional, more effective BMPs will need to be developed to achieve ultimate compliance, and the District should not assume otherwise. Experience demonstrates that technological innovation is likely to progress to support TMDL implementation. As stated above, compliance schedules are proposed that will allow future development and refinement of BMPs. Second, the proposed TMDL recognizes that pollutant trading mechanisms could be employed whereby the wasteload allocations could be effectively achieved by implementation of measures that result in direct removal of nutrients from the lakes and/or by implementation or enhancement of other projects intended to reduce internal nutrient loading. Other pollutant trading mechanisms may be proposed. Use of a specific pollutant trading mechanism would require Regional Board approval. Requirements for the implementation, review and revision of BMPs needed to address nutrient inputs in urban runoff would continue to be enforced under the terms of the MS4 permit.

In contrast to the District's assertion, staff believes that the proposed interim numeric targets are realistic and achievable. For example, as discussed in the TMDL Report, for Lake Elsinore, the proposed dissolved oxygen target was achieved during certain times in 2000 – 2001, and the total phosphorus and chlorophyll a targets were almost achieved in 2000-2001 (see Table 4-2), even in the absence of TMDL-required nutrient control measures.

Staff recognizes that it will likely be challenging to achieve the final proposed numeric targets and wasteload allocations. For this reason, staff has proposed a 15 year timeframe for compliance. This period will allow the evaluation of planned projects designed to address nutrient problems in the lakes and application of the results in development and implementation of additional projects and BMPs. This compliance

period will also allow additional data collection and analysis that may support revisions to the TMDLs.

Comment 3

There is a need for economic analysis of the proposed TMDLs. The cost to achieve the proposed TMDL target receiving water concentrations and the relative value of the expected improvements in attainment of beneficial uses must be fully identified and considered in the issuance of the TMDLs. A recent Superior Court decision requires that the factors specified in Water Code Section 13241, which include economics, must be considered when incorporating a TMDL in the Basin Plan.

Staff Response

First, the Superior Court case to which the District refers (the City of Arcadia *et al* versus the State Water Resources Control Board and the Los Angeles Regional Board) is currently on appeal. It is therefore not binding authority and there is no final judgment.

By its own terms, Section 13241 of the California Water Code applies to establishing water quality objectives. It does not apply to designating uses, or to establishing programs of implementation, which are governed by section 13242. Nor does Section 13241 apply to establishing TMDLs. Federal law mandates that TMDLs be set a level that will ensure attainment of the existing water quality standards (including objectives). The economic feasibility to the dischargers of achieving the standards is therefore neither relevant nor authorized when setting the TMDL. As explained in the TMDL report, the costs of the methods of compliance must be considered by the Regional Board as part of the CEQA process for the proposed Basin Plan amendment. This does not require a cost/benefit analysis. The District, as well as other dischargers, has provided cost information. Staff is not persuaded that the information submitted by the District is an accurate assessment since it does not address directly the wasteload allocations for stormwater, expressed as 10 year running averages, with 10 and 15-year compliance schedules. Nor does the assessment address the potential for implementation of pollutant trading mechanisms in lieu of the assumed treatment of stormwater. As noted above, staff has considered the likely difficulty, including cost, of meeting the TMDLs in recommending 10 and 15-year compliance schedules

At the same, time it must be recognized that there are costs associated with non-compliance with the TMDL. The fish kill in 2002 costs LESJWA \$17,000 in clean-up costs. Fish kills and the green algae on the Lake Elsinore surface also severely impact the use of the lake and therefore the revenue to the City of Lake Elsinore. If the TMDL were not implemented, fish kills could conceivably occur yearly and therefore potential costs for non-compliance would be approximately \$20,000 or more per year.

With the passage of Proposition 13 in 2000, the State of California has invested \$15,000,000 into improving Lake Elsinore, Canyon Lake and the San Jacinto River watershed. Without the implementation of nutrient controls in the watershed, the State's investment in improving water quality and beneficial uses in the lakes would likely be largely wasted. All parties responsible for nutrient inputs to the Lakes, including the District, must take appropriate responsibility for controlling them. This may take the form of source control BMPs, wastewater treatment, internal nutrient loading reduction projects and/or implementation of pollutant trading mechanisms. Innovative approaches and not

sole reliance on currently accepted and available technology will likely be necessary to achieve water quality standards in the lakes.

Comment 4

Revise the TMDL implementation plan to allow for the evaluation of the management measures either implemented or scheduled for implementation during the first five years (2005 – 2010) of the TMDL. In addition, the TMDL should specify that the first five years of the TMDL will be used to collect additional watershed and lake monitoring data, and implement test projects to analyze the effectiveness of potential nutrient control BMPs. The TMDL lake and watershed models should then be recalibrated with data collected during the five-year period.

Staff Response

As previously discussed, the proposed TMDLs include 10 and 15 year compliance schedules that will allow for the evaluation of management measures and collection of additional data. Additional data collection is a requisite part of the proposed TMDL implementation plan (Task 3). These data can be used to support lake and watershed model updates and revision of the TMDLs, if warranted. The proposed implementation plan explicitly requires that the watershed and in-lake nutrient models be updated (Task 10).

As shown in Attachment to the Resolution, staff now recommends that the compliance dates specified for urban dischargers (Task 6) be revised in order to be consistent with existing permit compliance dates.

Comment 5

Recommendation 1. Delete the unattainable final numeric target criteria for total phosphorus and total nitrogen

Staff Response

As previously discussed, TMDLs must be established to assure that water quality standards are achieved. The final numeric targets proposed in the TMDLs were based on best professional judgment of the nutrient levels needed to achieve that goal. As such, they are a requisite part of the TMDLs. Again, an extended schedule for compliance with these targets is also proposed. The final (and interim) targets can be revised based on additional data, update of the watershed and in-lake nutrient models, and evaluation of the efficacy of management measures that are implemented.

Comment 6

Recommendation 2. Review the conservative assumptions used to establish the numeric targets to see if the numeric targets can be set at or above the known nutrient irreducible concentrations and still be protective of Beneficial Use.

Staff Response

As discussed in the TMDL Technical Report, an implicit or explicit margin of safety (MOS) is a requisite component of the TMDLs. Because of uncertainty, conservative assumptions were used in the development of the TMDLs and constitute an implicit MOS. As also discussed in the TMDL Technical Report, as additional data are collected, a more

robust uncertainty analysis can be conducted and the MOS and TMDLs can be adjusted as appropriate. The proposed compliance schedules allow ample time for these analyses.

Further, as discussed in the response to Comment 3, the TMDLs must be established to meet water quality standards. Technical and/or economic feasibility cannot be used to establish the TMDLs. These factors are taken into account in the implementation plan for the TMDL, in particular, the schedules proposed for compliance.

Comment 7

Recommendation 3. Incorporate an economic analysis of the costs and benefits of the proposed TMDL.

Staff Response

Please see the response to Comment 3, above. Board staff welcomes information and analysis of the potential costs of compliance, as well as the costs of failing to implement nutrient control measures. This information will be presented to the Regional Board. It is appropriate to reemphasize here that the economic feasibility to the dischargers of achieving water quality standards is neither relevant nor authorized when setting the TMDLs

Comment 8

Recommendation 4. Revise the implementation schedule to allow time for dischargers to enter into cooperative agreements to fund and operate TMDL compliance programs. The implementation schedule should also be revised to place initial focus on the control of internal nutrient sources, the collection of additional data, assessments of the efficacy of nutrient control programs and the implementation of pilot nutrient control projects.

Staff Response

Staff supports the approach the District has outlined, to implement pilot projects, gather and refine models, etc., and believe that the proposed Basin Plan amendment already gives the flexibility to the dischargers to do these things. [We believe that adding the specificity recommended by the District for what should be accomplished within the 5-year period could potentially backfire if certain requirements are not met within the specified timeframe. It would be much easier to have the Regional Board approve a modification to a monitoring program or DAMP submittal than revising the Basin Plan to modify tasks and/or a due date].

RCFCD Comments in Attachment A of the letter - TMDL NUTRIENT DATA DEFICIENCIES

(If the comments are the same as in the main body of the letter, they are not repeated here)

Comment 9

The limnology of Canyon Lake is significantly more complex than that of Lake Elsinore, and therefore the targets proposed for Lake Elsinore may be too restrictive for Canyon Lake.

Staff Response

Canyon Lake and Lake Elsinore are located in the same watershed and spills from Canyon Lake are the most significant source of water for Lake Elsinore. The numeric targets for Canyon Lake must be stringent enough to ensure the protection of beneficial uses downstream. Therefore, staff used the same indicators and numeric targets for both lakes. The TMDLs, including the numeric targets, for both lakes are subject to review and revision based on additional data collection and analyses. The schedules for compliance allow time for this review to occur.

Comment 10

Two targets are proposed to reduce nutrient loading to Lake Elsinore – an interim 35% internal lake nutrient load reduction by 2015 and a final 70% internal lake nutrient load reduction by 2020. The feasibility of the reduction is uncertain.

Staff Response

The difficulties and uncertainties in developing and implementing the TMDLs are reflected in the compliance schedules proposed. Uncertainty does not obviate the need to establish TMDLs that will achieve compliance with water quality standards.

To expand on the information in the Technical Report for the TMDLs, a limnocosm study funded by LESJWA and conducted by Dr. Anderson at UCR demonstrated that aeration to maintain a dissolved oxygen level of 7 mg/L in the water column will reduce the phosphorus release rate by 39%. During this experiment, Alum treatment completely stopped the phosphorus release (although Alum treatment, at this time, is not feasible for Lake Elsinore due to high pH in the lake, it may become feasible in the future when and if the pH decreases). Dr. Anderson also tested the efficacy of treatment of the sediment with the addition of calcium. Calcium treatment reduced the phosphorous release rate by 67% (Final report submitted to LESJWA by Dr. Anderson, 2000). Other treatment options such as biomanipulation (e.g., fishery management), individually or collectively with other treatment options may reduce the phosphorus release rate by 70%. Therefore, possible alternatives to achieve the 35% and even the 70% reductions in internal phosphorus release have been identified and need to be investigated. The compliance schedules proposed in the TMDLs allow this evaluation and technological innovation to occur. In addition, the targets may be revised as new data and information become available.

Comment 11

The TMDL derivation period experienced below-average precipitation and sufficient flow did not occur to allow calibration of the models for wet year conditions. Thus, the TMDL models are not calibrated for wet conditions.

Staff Response

Staff has acknowledged the fact that wet season data were not available to calibrate the model. Thus, it is imperative that the data collection effort continue. Monitoring and update of the watershed and in-lake nutrient models are components of the proposed implementation plan. Once again, the proposed compliance schedules allow for additional data collection and refinement of both the models and the TMDLs.

RCFCD Comments from Attachment B of the letter - Are TMDL Targets Realistic?

(If the comments are the same as in the main body of the letter, they are not repeated here)

Comment 12

The beneficial uses identified for Lake Elsinore in the Basin Plan could not be attained under natural conditions. These beneficial uses can only be supported through the implementation of extreme and costly measures.

Staff Response

The relevant beneficial uses designated in the Basin Plan for Lake Elsinore (WARM, WILD, REC-1 and REC-2) are existing uses, as defined in federal regulation. Recognizing the value of these uses, both economically and from a recreational and wildlife perspective, substantial sums of money have been or are proposed to be expended to address the lakes' problems. For example, in the 1990s, the levee project cost nearly \$50 million to the federal and state government. In 2000, the State gave \$15 million for Lake Elsinore restoration. The City of Lake Elsinore and Elsinore Valley MWD have each spent \$650,000 per year for supplemental water. The City received a \$3 million grant (2004) from the California Department of Boating & Waterways to rehabilitate the Boat Launch Facility at the LERA Campground. The City will expend an additional \$1-4 million to complete the project.

Please see also the response to Comment 3.

Comment 13

The irreducible concentrations for TN and TP are almost twice their respective interim targets, indicating that the interim targets, much less the final targets, may be unachievable with current BMP technology.

Staff Response

The term "irreducible concentration" is used in the stormwater literature to represent the lowest effluent concentration for a given parameter that can be achieved by a specific type of stormwater management practice. The "irreducible concentrations" listed in your table were based on the examination of the effluent concentrations achieved by stormwater management practices from published studies for several parameters, including phosphorus and nitrogen. Recent research (ASCE 2000) indicates that achievable effluent concentrations vary appreciably between BMP types (p.33 in Urban Stormwater BMP Performance Monitoring, 2002.) Once again, the numeric targets only apply to the in-lake concentrations, not the effluent concentrations. The WLA for urban is applied to the urban sources entering the lakes.

See also response to Comment 2.

RCFCD Comments in ATTACHMENT C OF THE LETTER - NEED FOR ECONOMIC ANALYSIS

Comment 14

It is imperative that economic considerations be analyzed in adopting the TMDL.

Staff Response

Please see response to Comment 3.

RCFCD Comments *in* ATTACHMENT D OF THE LETTER - IMPLEMENTATION SCHEDULE

Comment 15

Compliance with TMDL targets should be delayed until further study of the applicability of the numeric targets can be completed. This period of study should be sufficient to allow for a wet year to occur. This would likely be no less than 5 years from adoption date.

Staff Response

The proposed TMDLs include 10 and 15 year compliance schedules that will allow for further study of the numeric targets.

Comment 16

It will take time to form the necessary discharger work groups, identify funding sources to prepare plans and participate in such a coordinated effort. Further the FY 2004-05 budget planning cycle has passed. Plan submittal dates should be respective of fiscal cycles. Some cities may also require additional time for the bid process to hire consultants.

Staff Response

Board staff has been working with stakeholders, including the District, on the TMDLs through the TMDL Workgroup since 2000, and this issue has been raised several times by the county, the watershed cities and others. Staff has consistently indicated that one of the likely components of the TMDL would be the requirement to continue the monitoring program, as well as to implement BMPs or other control measures. Staff has emphasized to the stakeholder group the need to get organized so that the costs associated with TMDL implementation can be shared among all the parties. Staff has gone so far as to invite a representative of the Newport Bay Watershed Management Committee to a meeting of the Lake Elsinore TMDL workgroup to describe how Newport Bay stakeholders have organized the various agencies and parties to implement the Newport Bay TMDLs. Since staff has been informing the TMDL workgroup about how these requirements were likely to be specified, the proposed requirements should come as no surprise to the District or watershed cities.

In response to this concern, however, the proposed Basin Plan amendment has been revised to require the revision of the DAMP and WQMP in 2006 (see Attachment to Resolution No. R82004-0037, Task 6).

There are existing stakeholder groups in the San Jacinto River watershed through which the dischargers could organize, e.g., San Jacinto River Watershed Council, and/or the Lake Elsinore and San Jacinto Watersheds Authority (LESJWA). Indeed, recently LESJWA has looked into a proposal that calls for the watershed cities and the county to begin levying a fee on property owners to help pay for the cost of addressing the nutrient problem downstream.

We encourage the county and watershed cities to be proactive and to begin now to organize the appropriate group or begin working with the San Jacinto River Watershed Council and/or LESJWA.

RCFCD Comments in ATTACHMENT E OF THE LETTER - RECOMMENDATIONS

Comment 17

The text on page 75 describing Tables 7-1 through 7-4 should make it clear that there are separate discharger nutrient allocations for Lake Elsinore and Canyon Lake.

Staff Response

We believe that the language on page 69, which states, "...the external loading component of the TMDLs was subdivided into two parts: one for the Canyon Lake (CL) watershed and the other for the Lake Elsinore (LE) watershed", provides the clarification necessary. Tables 7-1 through 7-4, and the language on page 75 speak for themselves. Staff does not believe any other clarifying remarks are needed.

Comment 18

The TMDL should include a framework under which pollutant trading may occur. There are four questions that should be answered in the framework: credit banking, credit tracking, implementation procedure and pollutant trading value of specific activities. Alternatively, the District suggests that the Regional Board could require the dischargers to develop this guidance as part of the Implementation Schedule.

Staff Response

Guidance from the State Board states, "When a TMDL is in place, the Clean Water Act (CWA) and the California law give wide latitude to develop creative means of achieving compliance with water quality standards (WQS), subject to certain limitations." (Memo from the Office of Chief Counsel, October 2001). The Regional Board certainly encourages pollutant trading given the arid climate and extreme variable hydrology. Based on this comment and comments from the City of Lake Elsinore, staff proposes that the Basin Plan amendment be revised to specify that all responsible stakeholders develop, for approval by the Regional Board, a pollutant trading plan. In addition, staff is proposing that the Basin Plan amendment acknowledge that pollutant trading is an option for dischargers in lieu of meeting their allocations (see Attachment to Resolution No. R8-2004-0037).

Comment 19

We request that the total atmospheric deposition be calculated for the entire watershed, removed from the other land uses and include [sic] as a LA in the model.

Staff Response

The nutrients from atmospheric deposition on the watershed enter the lakes via runoff and are accounted for in the load and wasteload allocations. If the atmospheric deposition over the watershed received a LA, it would greatly reduce the share of the TMDL (LA and WLA) given to other sources.

Comment 20

Several important nutrient control projects shall be initiated within the next five years..... As an alternative to the immediate implementation of the interim numeric targets, the first five years of the TMDL could be used to determine the impact of these activities on the beneficial uses in the lakes. Allowing time to examine alternative nutrient control mechanisms, refine and update the models, and propose revised numeric targets will ensure that limited discharger resources are spent on activities that will effectively address the lake impairments.

Staff Response

Please see the responses to Comments 4, 8 and 15. The 10 year average allocations, and 10 and 15 year compliance schedules allow for the analyses recommended by the District.

Staff supports the District's proposal to continue monitoring and to identify and implement pilot projects. The District/cities can include these proposed projects and schedules for the Regional Board's consideration as part of the submittals required in Task 6 of the proposed implementation plan.

Comment 21

The requirements of Task 5 are premature at this time since the State Water Resources Control Board has not adopted the regulations required under AB 885 and it is not a foregone conclusion that local agencies will enter into MOUs. Without MOUs, it is not possible to implement Task 5. Alternative language for this Task is proposed.

Staff Response

Staff agrees that additional time may be needed to allow for the adoption of the regulations and the development of necessary MOUs and other agreements. Staff recommends that the Basin Plan amendment be revised to specify that within 6 months of the effective date of an agreement between the Riverside County and the Regional Board to implement regulations adopted by the State Water Resources Control Board pursuant to Water Code Sections 13290-13291.7, or, if no such agreement is required or completed, within 12 months of the effective date of these regulations, the County of Riverside and the Cities of Perris... ..The Septic System Management Plan shall implement regulations adopted by the State Water Resources Control Board pursuant to Water Code Sections 13290-13291.7 (see Attachment to Resolution No. R8-2004-0037 – Task 5).

Comment 22

Tasks 8 and 9 of Appendix A should be revised to only name the entities owning the lakes. This would be consistent with recent positions taken by EPA, the State, and other Regional Boards that indicate that owners of facilities are responsible for the pollutants that they accept into their facilities.

Staff Response

The Regional Board regulates dischargers of waste. WLAs must be assigned to dischargers, not to the owners who receive the discharge. (40 CFR 130.2(h).) Lake Elsinore is not a "facility"; the MS4 system is a facility. The co-permittees are responsible for what comes out of the MS4 system pursuant to the MS4 permit.

Comment 23

Local governments were specifically and conspicuously excluded from 40 CFR 130.2(p)(2)(i); therefore all costs of implementing any task in the Basin Plan Amendment associated with nonpoint source pollution should be funded by the State as required by the Clean Water Act.

Staff Response

The District appears to be referring to a version of regulations that never came into effect. The 2000 regulations were adopted by the Clinton administration, but Congress barred enforcement and the Bush administration withdrew them. There is no section 130.2(p) in title 40 of the CFR. The regulations that currently apply are those that were issued in 1985 and amended in 1992 (40 CFR Part 130, Section 130.7).

Urban runoff, including stormwater, is regulated as a point source pursuant to an adopted areawide MS4 NPDES permit. Therefore, the urban component was properly assigned WLAs.

Staff would also like to point out that substantial State and federal funds (\$65+ million) have been to improve Lake Elsinore and the watershed. Please see also the response to comment 12.

RCFCD Comments in ATTACHMENT F OF THE LETTER- Specific Comments on Lake Elsinore and Canyon Lake Nutrient TMDL Report

Note: Staff does not expect to revise the TMDL Report presented at the Regional Board workshop on June 4, 2004. A separate staff report that describes proposed changes to the Basin Plan amendment based on consideration of comments received will be prepared. Nevertheless, the following responses to the comments on the TMDL Report are provided.

Comment 24

Pg. 6, 1st paragraph – Discussion should also include note that the lake occasionally goes dry, even before the levee was built.

Staff Response

Pg. 7, first paragraph states .."Lake Elsinore was completely dry in the 1950s and 1960s." This is shown graphically in Figure 2-2 on p.7.

Comment 25

Pg. 6, §2.2 – Discussion should acknowledge MSHCP will set aside vacant/open space land from being developed.

Staff Response

Comment noted. Future review/refinement of the TMDLs may entail update of land use information for allocation purposes. Set-asides of vacant/open space lands can be taken into account at that time.

Comment 26

Pgs. 6, 7, and 8 – The cutoff channel around Mystic Lake carries little sediment because it has a low capacity. The bypass channel has not substantially changed the historic sediment inflow to Mystic Lake. Approximately every ten years on the average, there is enough rainfall in one year to produce flows in the San Jacinto River near Mystic Lake.

Staff Response

Comment noted.

Comment 27

Pg. 17 Section 4.1.1 - During the reference state year of 2000-2001, Lake Elsinore had an average phosphorus concentration of .12 mg/L with no apparent algal blooms or fish kills and the lake was at an acceptable operational level. The use of the 25 percentile numeric target of 0.1 mg/L for the interim represents a direct 17% decrease in the waste load allocations for the watershed. While we recognize the need for a MOS, the 25% numeric target seems excessive.

Staff Response

Please see the responses to comments 1, 6 and 15. The proposed compliance schedules allow for the collection and analyses of additional data, and the proposed implementation plan calls explicitly for monitoring and update of the models used to develop the TMDLs.

Comment 28

Pg. 18, Table 4-2 – The Annual Average Total P should be reported in mg/L for direct comparison with the proposed numeric targets.

Staff Response

Comment noted.

Comment 29

Pg. 20 – Is there conclusive data to back up the claim that the floodwaters of 1993 and 1995 “carried high nutrient loads from the San Jacinto watershed to Lake Elsinore”?

Staff Response

The TMDL Technical Report presented at the June 3, 2004 workshop indicates that “Flood waters **likely** carried high nutrient loads from the San Jacinto River watershed to Lake Elsinore...” This is supported by data that indicate that the TP concentration in Lake Elsinore increased from non-detect to 0.65 mg/L from December 1992 to January 1993, an increase that can only be attributed to stormwater runoff.

Comment 30

Pg. 23, §4.2.3 – As fish kills in Canyon Lake are based solely on anecdotal evidence, the first sentence should read: “Control of dissolved oxygen is important for Canyon Lake since the depletion of oxygen may have caused occasional fish kills, and has caused high nutrient flux rates....”

Staff Response

Comment noted.

Comment 31

Pg. 47 – "...the LSPC model [developed by Tetra Tech] was never calibrated for the wet scenario". In fact, the model had very poor hydrologic calibration with the rainfall vs. runoff for the observed data that year. Since the proposed TMDLs are sensitive to these wet year calibrations, the TMDL numeric target implementation should be delayed until the wet year condition model can be calibrated.

Staff Response

Please see responses to comments 4, 11 and 15.

Comment 32

Pg. 50 – In Table 5-10b there appears to be an error in the moderate year section where the TN load from Canyon Lake sediment is included in the Lake Elsinore totals but not the TP load.

Staff Response

Actually, this is not an error. The EFDC simulated export of total phosphorus load to Lake Elsinore from Canyon Lake was zero.

Comment 33

Pg. 61, Equation 3 – TP target should be changed to C_{ss} to be consistent with the text that follows.

Staff Response

Comment noted. As stated above, no changes to the TMDL Report are proposed or necessary.

Comment 34

Pg. 66, first full paragraph – The last sentence states that "no reduction in the internal load of phosphorus for Canyon Lake" will be assumed as lake management studies have not been conducted. In wet years, approximately 40% of the phosphorus mass load to Lake Elsinore comes from Canyon Lake. As elimination of all inputs to Canyon Lake would not lead to a reduction of total phosphorus in the lake, loads leaving Canyon Lake in a wet year could lead to Lake Elsinore TMDL load targets not being met. This is a concern if enforcement action results when Lake Elsinore target loads are exceeded.

Staff Response

First, it is likely that measures to reduce total phosphorus in Canyon Lake will need to be implemented in the future. Thus, the proposed implementation plan explicitly requires evaluation of Canyon Lake sediment nutrient treatment options (Task 9). Second, reduction in nutrient loads to Canyon Lake will ultimately reduce the nutrient loads going out to Lake Elsinore. If the target loads from Canyon Lake to Lake Elsinore are exceeded, then investigation of the cause(s) and appropriate solution(s) will need to be conducted. The Regional Board retains enforcement discretion based on the circumstances, including whether or not responsible parties have made good faith efforts to comply.

Comment 35

Pg. 82, paragraph before §11.A. – The potentially affected parties will be asked to evaluate the TMDL-related costs. Any information the Regional Board already has should be provided.

Staff Response

Any information submitted to the Regional Board becomes a matter of public record. The supplemental staff report that will be prepared to describe changes to the proposed Basin Plan amendment is expected to include additional information concerning costs, based on comments received.

Comment 36

Pgs. 86 – Several dischargers have provided economic information for nutrient treatment management measures and water quality monitoring. This information should be summarized in Section 11 (Economic Considerations) and Table 13-1 (Nutrient Management Projects table).

Staff Response

Please see response to comment 35.

Comment 37

Pg. 87, Item C. – Local tax funds are listed as a source of public financing by the local agencies. In November 1996, California voters approved Proposition 218 (“The Right To Vote On Taxes Initiative”) amending Article XIII of the State Constitution¹. Proposition 218 produced changes to some of the Permittees’ historic funding sources and still looms as a potential threat to others. Additionally, with the current budget crisis in California and Riverside County, local agencies are being required to make across-the-board cuts in public programs, including police and fire protection and higher education.

Staff Response

Comment noted. Also, please see response to comment 3.

Comment 38

Attachment A, Page 2, Item 1., 2nd paragraph – Fish kills in Canyon Lake based solely on anecdotal evidence (Report, pg. 23). The sentence should indicate so.

Staff Response

Comment noted. No changes to the TMDL Report are proposed or necessary.

Comment 39

Attachment A, Page 10, 1st paragraph – Flexibility should be allowed to move or remove stations that are not providing useful information for the TMDL model or that present a risk

¹ The Proposition 218 amendments require voter approval of any new taxes, fees, assessments, etc. In addition, certain existing taxes and assessments were subject to the Initiative’s voter approval requirements. “Special taxes,” as defined by the Initiative, require a 2/3rds majority while other types of assessments may only require a simple majority. In addition, voter approval is required to raise any existing special tax or assessment rates.

to personnel during sampling events. Both the listing of stations and their sampling frequency are located in Table 5-9t.

Staff Response

The monitoring stations were carefully selected by the stakeholders and all the sites have been evaluated for safety concerns. Nonetheless, staff agree that changes to the monitoring stations may be warranted. Staff proposes to add language allowing flexibility in developing the monitoring programs (see Attachment to Resolution No. R8-2004-0037, Task 3).

Comment 40

Attachment A, Page 17, Task 6 – The Santa Ana Drainage Area Management Plan (DAMP) is currently being developed in a phased manner according to the time schedules in Board Order R8-2002-0011. The DAMP is to be submitted to the Executive Officer no later than January 1, 2005. Attachment A, Pages 18 and 19, Tasks 8 and 9 – The tasks require a proposed plan and schedule to evaluate in-lake sediment nutrient reduction and treatment as well as a monitoring program. The purpose of the monitoring program is to evaluate the effectiveness of the strategy that is implemented, and as such, the location of monitoring stations will necessarily come after the strategy is adopted. Establishing monitoring stations just for collecting “data” will not be a judicious use of public funds.

Staff Response

Staff is unclear about the intent of this comment. Tasks 8 and 9 of the proposed Basin Plan Amendment require responsible parties to develop schedules and plans to implement sediment control strategies for Lake Elsinore and Canyon Lake, respectively. These tasks also require that as part of the submittal of the sediment reduction strategies, a monitoring program to evaluate effectiveness is also required. The monitoring program would be implemented as an element of the implementation of the sediment reduction strategy. The responsible parties have flexibility to recommend a suitable monitoring program.

Comment 41

Attachment A, Pages 19 and 20, Tasks 10 and 11 – Nowhere in the task descriptions does it say that the Regional Board will assist in procuring funding. Regional Board staff's efforts to procure state and federal grant funding was vital to the success of the initial TMDL monitoring efforts, and the Permittees hope that these efforts will continue.

Staff Response

It is certainly Board staff's intent to continue efforts to procure funds that will support TMDLs.

Comment 42

Attachment A, Pages 19 and 20, Tasks 11 & 12 – The review/revision of the Lake Elsinore/Canyon Lake Nutrient TMDL would need to be accomplished prior to the review and revision of water quality objectives. It is recommended these two tasks be switched so that Task 11 is the review/revision of nutrient TMDL and Task 12 is the review/revision of the water quality objectives.

Staff Response

As indicated in the description of Task 13 (previously Task 12 in the May 2004 draft Basin Plan Amendment), the Regional Board is committed to the review of these TMDLs every three years, or more frequently if warranted by consideration of additional data and information. It is appropriate to review the status and efficacy of the TMDLs even though the review of water quality objectives is not complete.

Comment 43

Attachment B, Items I (Aesthetics) and IV (Biological Resources) – BMPs or treatment measures constructed to meet the interim and final TMDL targets could be aesthetically unpleasing due to large land requirements. Such lands may include those currently supporting riparian habitat or sensitive species. This needs to be acknowledged in the Environmental Checklist.

Staff Response

Staff agree that there may be potential impacts to aesthetics and biological resources from the implementation of BMPs and have revised the environmental checklist accordingly. It is important to note that any potential impacts potential impacts would be subject to further site-specific CEQA analysis and certification.

Dick Watenpaugh
City Manager, City of Lake Elsinore
(letter dated May 24, 2004)

Comment 44

The quality of life for the citizens of Lake Elsinore is fundamentally dependent on the quality and quantity of water in Lake Elsinore. There is great diversity of frequently competing interests within the Lake Elsinore and San Jacinto River watershed. The City of Lake Elsinore's jurisdictional ability to control nutrients from the watershed is less than 5% of the entire watershed.

Staff Response

Comments noted. The significance of the Lake as a resource is recognized in the TMDL documents. The purpose of the TMDL is to improve and protect that resource via control of nutrient inputs from all significant sources throughout the Canyon Lake/Lake Elsinore watershed.

Comment 45

All inhabitants of the watershed contribute to the nutrient problem and therefore, all must also contribute to solving the Lake's problems in order to protect the beneficial uses of the Lake. Lake Elsinore will never be Lake Tahoe but reasonably strict controls must be set in motion to prevent nuisance conditions and protect beneficial uses. Hopefully, the Regional Board will remain engaged in the long-term challenge to address problems in the Lake through adoption of the phased Nutrient TMDL.

Staff Response

Comment noted. In staff's opinion, all major nutrient sources have been identified in the proposed TMDL and control actions for reducing nutrient loads are specified. Staff believes that the implementation of the proposed TMDL and Implementation Plan would result in meaningful water quality and beneficial use improvements for Lake Elsinore.

Pat Kilroy
Director of Lake and Aquatic Resources, City of Lake Elsinore
(letter dated June 3, 2004)

Comment 46

The monumental effort to consolidate available data for the Nutrient Source Assessment was hampered by the relevance of the historic data and by the nature of data collection in an arid watershed. Future monitoring will improve model accuracy and provide a useful nutrient reduction tool.

Staff Response

Staff has acknowledged in the technical TMDL report that the development of the TMDL relied to a large extent on the use of the watershed water quality simulation models and that data to allow calibration of wet conditions were lacking. Nonetheless, the recommended TMDLs are based on the best scientific information available for the watershed. As a phased TMDL, the recommended implementation plan includes specific

monitoring requirements to ensure that data gaps are filled, as well as specifying requirements for the update of the models.

Comment 47

The Nutrient Source Assessment focused on the export to the lakes of nutrients from multiple land uses, but failed to quantify the major sources of nutrients to the watershed itself. Source control will ultimately reduce the mass of nutrients transported to the lakes.

Staff Response

As required, the nutrient source assessment evaluated the likely sources of nutrients from the San Jacinto River watershed to the lakes, given land use conditions in 1993. This is the definition of a source assessment to support development of a TMDL. Mr. Kilroy is essentially recommending that the TMDL include an analysis of the specific sources of nutrients, e.g., fertilizer addition, manure, etc., and whether, through source control, such specific sources of nutrients could be reduced. This effort is outside the scope of what is required as part of the source assessment and is best left to the responsible agencies to investigate as part of their efforts to comply with established wasteload and load allocations. Staff agrees that this evaluation by responsible agencies and parties is a critical component for implementation of the proposed TMDLs. We expect the implementing agencies and parties to conduct this evaluation in order pinpoint appropriate steps to mitigate nutrient inputs from their jurisdictions.

Comment 48

Given the arid conditions in the San Jacinto River watershed, the use of a conventional phased TMDL, adjusted based on annual water quality monitoring, is not practical. Given hydrologic conditions in the watershed, which are characterized by floods and droughts, the infrequent monitoring that is likely to be feasible is insufficient to implement the TMDL program in a timely manner. Different environmental factors require a different approach.

Staff Response

Staff agrees that the unique hydrology of the San Jacinto River watershed poses challenges for developing, implementing and refining the Lake Elsinore and Canyon Lake Nutrient TMDLs. Given the long-term precipitation history in the watershed, there is likely to be limited data collected for the wet conditions. Nonetheless, staff believes that recommended approach for addressing nutrients emanating during wet conditions is feasible and necessary and will address the long-term build-up of nutrients in the lake sediment.

Comment 49

The proposed interim numeric target for chlorophyll a was nearly achieved during 2000-2001, a period preceded by 2-3 years of no significant inflow into the lake. This shows that in just a few years without nutrient input to the Lake, it is possible to reduce algal levels low enough to approach the near-term goal. Implementing remediation measures (lake stabilization, aeration and fishery management) will further reduce algae levels to achieve the algal biomass goal.

Staff Response

Comment noted.

Comment 50

A large shallow lake that is the terminus of a large watershed and located in an arid region is ecologically hyper-sensitive to nutrient pollution. The trophic state of the Lake [Elsinore] prior to European civilization is not known, but an on-going sediment geochronology study may provide clarification of the extent to which man's presence has accelerated eutrophication. Recent monitoring data collected for the TMDL development shows the extent to which nutrient concentrations in flows that enter Lake Elsinore are elevated when compared to nutrient concentrations emanating from the mountain areas.

Staff Response

Comment noted. Board staff recognizes that eutrophication of lakes is a natural process that may take thousands of years. Given that Lake Elsinore is a natural lake, one would expect the lake to become eutrophic over a span of years. However, it should be recognized that the approach staff is recommending is not to take Lake Elsinore back to an oligotrophic or mesotrophic status, but to maintain the lake conditions at the 'better' end of the eutrophic scale. This approach would prevent further eutrophication as the result of anthropogenic activities and improve water quality and beneficial uses.

Comment 51

The 10-year running average approach for the TMDL, wasteload allocations (WLA) and load allocations (LA) conflicts with the 5-year schedule for re-evaluation of the TMDL. The proposed 10-year approach is proposed to address the varied hydrological conditions in the watershed, but this might not be appropriate either given the unpredictability of these conditions. The TMDL, WLAs and LAs should be set as 5-year running averages in order to be consistent with the proposed 5-year TMDL review schedule.

Staff Response

Task 13 (previously Task 12) of the proposed Basin Plan amendment (Attachment to Resolution No. R8-2004-0037) specifies that the TMDL, WLAs and LAs would be reviewed at least once every 3 years in order to coincide with the Regional Board's triennial review process. This would include review of the status of submittal/implementation of reports and tasks required by the TMDLs, as well as the status of compliance with the WLAs and LAs. Initially after the date the TMDLs become effective, compliance with the proposed 10-year running average WLAs/LAs could not be judged for a period of ten years. However, that does not preclude interim assessment of the efficacy of control measures implemented to begin to achieve compliance. Further, once the initial ten-year period has elapsed, compliance could be judged annually, if desired, given that the WLAs/LAs are expressed as running averages.

Staff believes that specifying a compliance schedule of 10 years is the most reasonable method for implementing the TMDL in this watershed. Staff recognizes the varied nature of precipitation and that a significant wet event may not occur in the 10-year period, however, the same circumstances could occur during a 5-year period. Based on a review of the long term flow records, staff believes that the wet events occur every 7 to 8 years. Therefore a 10-year running average approach appears to be reasonable.

Comment 52

The mean annual overflow from Canyon Lake to Lake Elsinore (using a 73 year record) and the annual runoff from the local Lake Elsinore watershed should be used as the

bases for specifying gradual reductions in phosphorus concentrations. Based on the proposed phosphorus WLA for local Lake Elsinore urban runoff, the urban stakeholders would be required to lower total P concentrations to a degree (0.05 mg/L) that is not reasonable in the proposed timeframe (by 2015) and that is much more restrictive than upstream stakeholders. Mr. Kilroy presents tables showing a scheme for the gradual reduction of phosphorus from both the upper watershed and the local Lake Elsinore watershed.

Staff Response

Based on the Tetra-tech modeling analysis, the existing load of phosphorus from urban discharges in the local Lake Elsinore watershed is 124 kg/yr, which is the same as the proposed interim WLA (see Table 7-1 of the Technical TMDL report). Mr. Kilroy implies that meeting this allocation is unfeasible, however, (again based on model predictions), this allocation is currently being met and no further reductions would be needed for urban discharges to meet the Lake Elsinore interim WLA.

The approach outlined in the table discussed by Mr. Kilroy has a couple of significant flaws. First, the values in the table listed as 5-year averages are not 5 -year averages. Instead, they are a calculation of the total flow over a 5 year period. Second, the proposed WLAs are not linked to compliance with the proposed numeric targets, as required. Mr. Kilroy's proposed approach would significantly and unnecessarily limit TMDL refinement and implementation flexibility.

Staff certainly supports the notion of urban dischargers (and all other discharges, in fact) developing a gradual reduction scheme for ensuring that the interim and final numeric targets are met. We don't believe, however, that the proposed scheme for annual reduction requirements should be included as part of the Basin Plan. This would greatly reduce the flexibility that staff has tried to incorporate into the recommended TMDL to allow dischargers to develop schedules and priority projects based on what they believe would work for them. It is entirely feasible that a discharger could achieve no reduction in year 2, but have a 50% or more reduction in year 5 due to the implementation of some type of project. Therefore, staff does not recommend any changes to the recommended TMDL and Basin Plan amendment based on this comment.

Comment 53

The recommended monitoring program requirements are too costly and are inadequate to characterize and assign responsibility for the phosphorus loading from all sources within the 760 square mile San Jacinto River watershed.

The phosphorus WLAs and LAs are calculated by multiplying the water flow volume by the phosphorus concentration. There is nothing inherently polluting from the volume of water flowing to the lakes. Rather, the concentration of a pollutant contained in the flowing water fundamentally determines the mass of pollutant transported. The Regional Board has no reason to limit the volume of flow from the San Jacinto River. A maximum nutrient threshold concentration should be applied to all sources as a matter of equity. A secondary phosphorus concentration threshold of 0.5 mg/L for flowing water in all tributaries to the San Jacinto River should be developed to facilitate pollutant source-tracking, timely "cause & effect" compliance, equity and reduced sampling costs".

Staff Response

Staff notes that Mr. Kilroy was an active participant in the development and implementation of the nutrient source assessment monitoring program that he now finds flawed. Staff believes it has been a very successful program for collecting data and information on nutrient loading from the watershed. One of the goals of program was to develop a sampling protocol that could be used long-term for TMDL program implementation. The Lake Elsinore and San Jacinto Watershed Authority (LESJWA) has invested a significant amount of their Prop. 13 budget to support the TMDL monitoring program. Certainly, as the stakeholders move toward TMDL implementation, refinement of the monitoring program is feasible and desirable. However, in staff's opinion, the proposed TMDLs properly identify the minimum number of sampling stations and analytical parameters needed to continue to fill in data gaps, update the watershed model and determine progress toward compliance with the TMDL, WLAs and LAs.

Staff agrees that the Regional Board has no reason to limit the volume of flows entering the lakes, and the proposed TMDLs do not attempt to do so. Sections 6 and 7 of the Technical Report describe the derivation of the TMDLs, WLAs and LAs in detail. The TMDLs are weighted average loads that account for the anticipated flows, based on the historical record of hydrologic conditions. The WLAs and LAs are derived in turn from these weighted average loads. The mass load approach is necessary to address the cumulative nature of nutrient build-up in the lakes. Nutrients entering the lake remain in the lake for years and make a continuing contribution to the internal sediment load. The concentration-based approach suggested by Mr. Kilroy would not address this concern. The comment letter from Mr. David Smith, US Environmental Protection Agency confirms this. Mr. Smith points out that "...concentration-based allocations alone...would permit massive nutrient loading into the lake sediments during moderate and wet years, which would then cause eutrophic and impaired conditions in moderate and dry years." Mr. Smith indicates support for staff's proposed mass loading approach. (See also comment 109).

It is not clear to staff that the secondary, concentration-based approach recommended by Mr. Kilroy would accomplish the goals he has identified. This proposal would necessitate developing a monitoring program that could conceivably involve many more sampling station locations and/or require additional personnel, and therefore cost savings may not be realized. Mr. Kilroy's proposed approach would likely result in inconsistent monitoring that is conducted year to year as different sampling points would potentially be used each year, resulting in data that could not be compared year-to-year. Further, in staff's opinion, the recommended approach would result in an unrealistic regulatory burden. For example, if phosphorus concentrations measured at a site in the City of Hemet were 0.6 mg/L would that be considered non-compliance under Mr. Kilroy's approach, and if so, what steps would be taken? Additional sampling at that site to confirm an exceedance or enforcement actions by Regional Board or other responsible agency? In addition, it may be that the flows from the one site in Hemet with phosphorus concentrations at 0.6 mg/L have little likelihood of reaching Canyon Lake and/or Lake Elsinore. Spending time taking an enforcement action provides little benefit to water quality. It is for that reason, that staff is recommending a flexible implementation plan that allows the dischargers to collectively craft their monitoring program, BMPs or other control measures that make sense for the watershed.

Comment 54

Water quality indicators, bioassay studies and nutrient studies demonstrate that phosphorus is the limiting nutrient for algae growth in Lake Elsinore. The nutrient studies indicate that nearly all the nitrogen added to the Lake [Elsinore] is generated internally through nitrogen fixing blue-green algae. The best way to control nitrogen input to Lake Elsinore is to limit phosphorus, since this would reduce the biomass of nitrogen fixing bacteria. Mr. Kilroy recommends that a total ammonia standard for the San Jacinto River be established and that either the nitrogen target be set using a 15:1 nitrogen to phosphorus ratio (instead of the proposed 10:1), or the nitrogen targets, TMDL, WLAs and LAs be eliminated.

Staff Response

As discussed in the TMDL Report, for Lake Elsinore, staff agrees that the primary limiting nutrient is phosphorus. However, staff also notes that recent studies conducted by Dr. Anderson indicate that Lake Elsinore is trending toward nitrogen limitation (R. A. Viegas Nascimento, M. A. Anderson, "Lake Elsinore Recycled Water Project", Draft Final Report, August 2004). Therefore, staff believes it is critical that the TMDL address both nitrogen and phosphorus. Given, that nitrogen is not the primary limiting nutrient for Lake Elsinore, staff agrees with Mr. Kilroy's recommendation to use the upper range of nitrogen to phosphorus ratio of 15:1 as the proposed numeric target. The revised proposed Basin Plan amendment reflects this change in revised nitrogen TMDLs, numeric targets and wasteload and load allocations. (The use of the TN:TP ratio to determine the limiting nutrient is a rough estimate. If the ratio is greater than 20:1 then the lakes are considered P-limited. If the ratio is between 20:1 and 10:1, then the lakes are considered co-limited by both N and P. If the ratio is less than 10:1, then the lakes are considered N limited. There is a debate in literature about the exact ratio and even the validity of this method. However, many limnologists find this method easy and convenient to use. Other methods are used to determine the limiting nutrient as well, such as bioassay (artificially adding P and N to monitor the algal growth)).

As was also discussed in the TMDL Report (see Section 4.2), nitrogen is the primary limiting nutrient in the main body of Canyon Lake, although phosphorus can be the limiting nutrient both spatially (e.g., the East Bay) and temporally. Therefore, in staff's opinion, to control algae growth in Canyon Lake, the TMDL must address both phosphorus and nitrogen. The proposed nitrogen TMDLs, numeric targets, and wasteload and load allocations for Canyon Lake have been also revised to reflect the 15:1 TN:TP ratio to assure consistency.

With respect to eliminating the nitrogen targets, TMDL, WLAs and LAs for Lake Elsinore, staff does not agree. Again, the nitrogen TMDL and allocations address eutrophication in Canyon Lake and at the same time will ensure protection of aquatic wildlife in both lakes from un-ionized ammonia toxicity. Nitrogen discharged from the watershed to Canyon Lake and Lake Elsinore results in the accumulation of nitrogen in the sediment. Nitrogen is converted to ammonia and can 'flux' back into the water column. As noted in the Fishery Management Plan prepared by Leidy and Associates, un-ionized ammonia may be partly responsible for historic fish kills. Controlling phosphorus inputs to Lake Elsinore but not controlling nitrogen inputs may result in less fish kills due to low dissolved oxygen, but may not mitigate fish kills due to un-ionized ammonia toxicity. The May 21, 2004 TMDL Report indicated that ammonia targets would be specified in the proposed TMDLs, but these were inadvertently omitted from the proposed Basin Plan amendment. This

oversight has been corrected in the revised amendment. The proposed ammonia numeric targets are based on the national ammonia criteria, however, it may be appropriate to establish site-specific un-ionized ammonia objectives for both Canyon Lake and Lake Elsinore. Developing an un-ionized ammonia site-specific objective can be a very time intensive and costly process, and stakeholder funding support will be needed to accomplish this effort. Staff recommends that this effort be added to the proposed Basin Plan amendment, Task 12 – Review and Revision of Water Quality Objectives.

Comment 55

The TMDL Implementation Plan should include specific recommendations for changing land use practices in the San Jacinto River watershed and a timetable for compliance. The TMDL program is necessary due to the failure of technology-based BMP standards to protect the Lake. An example is the dairy regulatory program. According to the Regional Board report, “Dairies and Their Relationship to Water Quality Problems in Chino Basin” (1990), the Board limits the amount of manure that can be spread based on agronomic application rates for nitrogen. However, the amount of phosphorus contained in this allowable amount of manure far exceeds plant requirements and results in excess amounts of phosphorus applied to land. The 2002 Annual Report of Animal Waste Discharge (Regional Board report) provides data on the large amount of phosphorus added to the San Jacinto River watershed. The Regional Board should require soil testing and agronomic manure application rates for the pollutant of concern (phosphorus) based on existing USDA guidelines. Implementation of nutrient management plans by agriculture should be mandatory, not voluntary.

Staff Response

As Mr. Kilroy is likely aware, Regional Board staff is currently in the process of revising the general waste discharge requirements for confined animal feeding operations (dairies and related facilities – Order No. 99-11). The current draft of the dairy permit, scheduled to be presented to the Board this year, prohibits the application of manure (including its use as fertilizer) anywhere in the San Jacinto Basin, and prohibits the discharge of runoff from the dairies under most circumstances. The draft revised permit will include a time schedule in the permit to phase out land application of manure, and will allow dairy discharges in the event of chronic or catastrophic storm events.

Staff disagrees with the contention that all the phosphorus present in manure is “added to the San Jacinto Watershed.” On the contrary, only phosphorus that enters surface water will impact Canyon Lake and Lake Elsinore. There is little potential for phosphorus to leach through soil into groundwater. Soil particles have a large capacity to fix phosphorus in forms that are immobile in soil. Most soils filter out soluble phosphorus as water passes through the soil profile into groundwater. Although the capacity of soil to adsorb phosphorus can be overwhelmed in sandy soils or when the water table is close to the soil surface, staff does not believe that this situation occurs in the San Jacinto Watershed. It is likely that most of the phosphorus applied in manure or fertilizer is fixed in the soil, and the critical issue is to control phosphorus in runoff from agricultural lands where manure was applied (i.e., implementation of appropriate BMPs) and the occasional runoff from dairies during catastrophic storms.

The proposed implementation plan for the TMDL requires the development of Nutrient Management Plans and the implementation of those plans upon Regional Board approval.

Comment 56

The multiple uses of reclaimed water in the San Jacinto River watershed provide a significant benefit to supplement the region's water supply. The production and use of reclaimed water should not be counterproductive to the Nutrient TMDL program. The waste discharge requirements for the use of reclaimed water throughout the watershed should be revised to meet the minimum treatment standard of best available technology (BAT) economically achievable for the removal of nutrients.

Staff Response

The proposed TMDL specifies wasteload allocations for the direct addition of recycled water to Lake Elsinore as a source of supplemental water supply. Compliance with these wasteload allocations will require POTW improvements to achieve BAT standards. However, staff does not believe that comparable requirements should apply to the production of reclaimed water to be used for landscape irrigation, etc. in the watershed. Waste discharge requirements for POTWs in the watershed require the producer and end user to contain the reclaimed water on-site (i.e., no discharges to surface waters tributary to the lakes are authorized). It's not clear whether the phosphorus present in reclaimed water used for irrigation contributes to the eutrophication of the lakes via transport through the vadose zone/groundwater flow. The San Jacinto Watershed nutrient management plan developed by LESJWA identified this as a data gap. If there is clear evidence that the reclaimed water used for irrigation is an important source of nutrients to the lakes that needs to be controlled, changes to the TMDL allocation scheme to control such sources can be considered.

Comment 57

Pollutant trading options should be based on scientifically defensible improvements to water quality. Not all pollutant trading is equal – to reduce algae growth, removal of soluble reactive phosphorus is needed instead of removal of particulate phosphorus. In addition to nutrient concentrations, lake level is an important factor for consideration, Lake Elsinore's high phosphorus internal load can be partially mitigated by the addition of a sufficient quantity of water. Pollutant trading proposals should be approved by the Regional Board, based upon an evaluation of their contributions to attainment of the algal biomass and dissolved oxygen indicators for the interim and final TMDL.

Staff Response

Staff agrees that the Regional Board should approve any pollutant trading proposal and has modified the proposed TMDL Basin Plan amendment appropriately. We also agree that pollutant trading proposals should result in meaningful water quality improvements that contribute to compliance with the numeric targets specified in the TMDL.

See also response to Comment No. 18

Comment 58

It should be stated in the TMDL that there is no relationship between the WLA for supplemental water and the LA for agriculture. Based on the unusual hydrologic condition

of the San Jacinto River Watershed, the supplemental water will only be added in years with low inflow from the Watershed.

Staff Response

Comment noted. The separate WLAs and LAs are explicitly identified in the proposed TMDLs and staff is not persuaded that there is a need to provide any additional clarification or qualification.

Bruce Scott

**Agriculture and Dairy Industry Representatives in the San Jacinto River watershed
(Oral comments received at the June 4, 2004 workshop)**

Comment 59

Mr. Scott discussed the formation of the San Jacinto Watershed Council and the Western Riverside Agriculture Coalition. The goals of the Watershed Council and the Coalition are to bring stakeholders together and to assist the agriculture and dairy community in addressing not only TMDL issues, but CAFO permit issues as well.

Staff Response

Comment noted. Staff commends the proactive involvement of the agriculture and dairy community in dealing with TMDL issues. We note that Mr. Scott has been an active participant in TMDL stakeholder meetings and is always willing to engage Board staff and other stakeholders in addressing complex TMDL issues.

Comment 60

Mr. Scott expressed concern about data gaps, in particular, how Mystic Lake affects nutrient loading from the upper watershed. Mystic Lake only overflows approximately every 10 years. Nutrient discharges from the upper watershed do not affect the lower watershed (Canyon Lake and Lake Elsinore) and therefore should be of lower priority for implementation of nutrient controls.

Staff Response

Board staff recognizes that data gaps exist, particularly understanding the role Mystic Lake plays on the nutrient loads to the downstream lakes. In order to address data gaps, staff has proposed to continue the watershed (and in-lakes) monitoring programs to fill-in data gaps. Board staff also proposes to review and revise, if necessary, the TMDLs, wasteload allocations and load allocations, if warranted by new data or studies (Draft Implementation Plan - Task 12).

Comment 61

Mr. Scott emphasized that limited dollars should be spent where it will achieve the biggest reduction. It may not make sense to implement nutrient reduction on a watershed-wide basis, given that the upper watershed contributes to the downstream area (below Mystic Lake) approximately once every 10 years. One dollar spent on a project for nutrient control that is effective and/or operates every year is money better spent than on a project that is only effective every tenth year. The funding should be spent where there is the most benefit in reduction.

Staff Response

Staff agrees that TMDL implementation efforts should be focused on nutrient reduction projects on a priority basis. This type of strategy can be proposed by the watershed stakeholders, either collectively or individually, as they develop their implementation programs. Further, staff supports a pollutant trading program in the watershed to encourage stakeholders to implement projects operated on or near the lakes, where the benefits from reduction strategies would be most beneficial. Given that the Regional Board cannot specify what BMPs or projects should be constructed to meet the wasteload and load allocations, a reasonable approach that staff could support is for all watershed

stakeholders to form a task force or committee to look at all the nutrient reduction options on a watershed-wide scale, prioritize projects, identify funding mechanisms, and conduct the necessary studies to formulate the exact projects that are most cost efficient. Staff recognizes that this has been done to some extent in the development of the San Jacinto Nutrient Management Plan (Tetra Tech, Inc., 2004).

Comment 62

Mr. Scott asked that the Riverside County Flood Control and Water Conservation District re-open and re-address the San Jacinto River Master Plan. The current Master Plan addresses Reach 4 and Reach 3, however, the Mystic Lake area is not considered in the Master Plan or addressed in updates to the Master Plan.

Staff Response

Board staff recognizes that there have been no flood control projects planned for the Mystic Lake area. However, this issue is out of the scope of the TMDL process. As discussed above, Mystic Lake and the role Mystic Lake has on water quality in the two lakes downstream requires further study. As part of the San Jacinto Watershed Nutrient Management Plan, a study to collect data on Mystic Lake is proposed. Board staff supports this project.

Comment 63

Mr. Scott indicated that the agricultural industry is working with U.C. Riverside Cooperative Extension to develop an Agricultural Nutrient Management Plan.

Staff Response

UC Cooperative Extension was awarded a federal nonpoint source grant to develop the Agricultural Nutrient Management Plan. Recognizing the importance of addressing nutrients in the San Jacinto watershed, Board staff worked closely with the UC Cooperative Extension and Pat Boldt Consulting to secure the grant. Regional Board staff will continue to work and coordinate with the agricultural community as the grant is executed. Board staff is also committed to assist the agriculture community in identifying and securing additional funding opportunities to implement nutrient controls.

Comment 64

Mr. Scott indicated that, to be equitable, all industries -- urban, agriculture, or others -- should implement BMPs to address the problem.

Staff Response

Board staff agrees and the proposed TMDLs require load reductions from all sources in order to meet water quality standards.

Sid Sybrandy
Dairy Industry Representative in the San Jacinto River watershed
(Oral comments received at the June 4, 2004 workshop)

Comment 65

Mr. Sybrandy discussed the formation of the San Jacinto Watershed Council and the Western Riverside Agriculture Coalition. Mr. Sybrandy noted that he serves as the Coalition Chairman. Mr. Sybrandy indicated that the Coalition intends to work with the Regional Board to protect the environment and water quality.

Staff Response

Comment noted.

Anthony J. Pack
General Manager
Eastern Municipal Water District (EMWD)
(letter dated June 28, 2004)

Jayne Joy
EMWD
(Oral comments received at the June 4, 2004 workshop)

Comment 66

The numeric targets have been set without the benefit of understanding the resulting effects of recycled water discharge at its current quality. Recycled water is used as a supplemental water source only in times of dry weather to ensure and stabilize the lake level. Because of this lack of understanding of the effects of recycled water addition, numeric targets had to be based on limited analytical data and literature values. Factors such as economics, wet-weather characteristics and lake dynamics were not considered in the establishment of the target values simply because they're unknown.

Staff Response

Federal TMDL regulations require that quantifiable and measurable numeric targets that will ensure compliance with water quality standards (including beneficial uses and water quality objectives) be established in the TMDL. The proposed numeric targets were established based on the best data available and application of model analyses and best professional judgement concerning the levels of nutrients, chlorophyll a, and dissolved oxygen that would assure that water quality standards for the lakes are met. Data deficiencies are explicitly acknowledged and reflected in the proposed compliance schedules and implementation plan requirements for monitoring (including the collection of wet-weather data), model updates and periodic review of the TMDLs to consider appropriate refinements. It is important to point out that identification of numeric targets cannot be based on economic factors. Rather, as specified in federal regulations, the targets and TMDL must be established to ensure the protection of beneficial uses and compliance with established water quality objectives (narrative and numeric objectives) under all hydrologic conditions. (Please see also the response to Comment 3).

The Regional Board amended the existing NPDES permits for both EMWD and Elsinore Valley Water District (EVMWD) to allow the discharge of a specific amount of recycled water to Lake Elsinore. The permit amendments enabled the implementation of a 2½ - year pilot project designed to evaluate the effects of recycled water on lake water quality. The pilot program permit is scheduled to expire on December 1, 2004. The Regional Board approved the amendments recognizing the significance of lake level on water quality and beneficial uses in the lake, and the need to forward efforts to identify some reasonable balance.

Staff recognizes that the final evaluation report for the recycled water pilot project (and monitoring program) has not yet been prepared. The final report is due to be completed later this year. However, several quarterly reports have been prepared since the beginning of the pilot project (June 2002). Data summarized in the quarterly reports show that current phosphorus and nitrogen concentrations in the recycled water are much

greater than the in-lake phosphorus and nitrogen concentrations. In addition, the relative percentage of nutrient mass loads from the recycled water discharge to Lake Elsinore have been much greater than the relative percentage of nutrient loads from all other waters. In other words, with the discharge of recycled water at current quality to Lake Elsinore, the lake is receiving a small volume of water, but relatively speaking, a large amount of nutrients (4th Quarterly report by UCR, 2003). It is staff's opinion that nutrients entering the lake in recycled water discharges will be bound in the lake sediment and subject to re-release to the water column. The impact of this nutrient load will likely last for many years and could potentially thwart other nutrient sediment reduction projects such as aeration. Technology exists to improve recycled water quality. While the lake level benefits are recognized, it is both necessary and reasonable to require recycled water quality improvement.

Comment 67

EMWD recommends that the establishment of TMDL standards be postponed until the recycled water pilot program is complete and lake dynamics are understood. Then, appropriate target levels can be established.

Staff Response

The Regional Board is obligated to adopt TMDLs, including numeric targets, for impaired waters such as Lake Elsinore and Canyon Lake. The TMDLs must be based on the best data available and are subject to review and refinement as uncertainties are addressed. (See also response to Comment 66).

It is evident to staff that controlling nutrient loads to Lake Elsinore, including those in recycled water, is essential to reduce algal biomass and the depleted dissolved oxygen conditions that cause or contribute to fish kills. The proposed TMDL, including the wasteload allocations and load allocations, are based on the best available data concerning the nutrient load reductions necessary. However, a phased TMDL approach is recommended given the recognition that nutrient dynamics in the lake are very complex and that a full understanding of these dynamics and the most effective and efficient nutrient control measures is not likely to be attained for many years. As additional data are collected and as a better understanding of lake nutrient dynamics is obtained, such as through implementation of the LESJWA projects (e.g., aeration and biomanipulation), the TMDL and its components can be revised accordingly. The compliance schedules proposed by staff allow for this refinement.

Comment 68

TMDL Guidance indicates that an adequate basis for an interpretation of water-quality standards is required. Since Lake Elsinore does not have phosphorus water quality objectives, the numeric targets would become the standards as a placeholder. Further, because the numeric targets would become, by default, water quality standards, the Porter-Cologne Act requires economic analysis should be conducted.

Staff Response

Staff is unclear to which guidance is being referenced. . Nevertheless, we certainly agree that the numeric targets, and other components of the TMDL, should be based on sound data and analyses. The proposed numeric targets are based on the best available data and best professional judgment of the targets necessary to assure that narrative water

quality objectives are attained and beneficial uses are protected. Numeric targets are not water quality standards. They are an interpretation of existing water quality standards. If and when sufficient data are obtained to establish phosphorus and nitrogen water quality objectives for the lakes, additional analysis as required by the California Water Code §13241 would apply. If staff believed at this time that the proposed numeric targets would be appropriate as water quality objectives, staff would have made this recommendation as part of the TMDL process. It is staff's opinion, however, that additional monitoring data are needed prior to establishing numeric nutrient water quality objectives for Lake Elsinore or Canyon Lake. This is reflected in the recommended Implementation Plan (Task 11). In Task 11, staff proposes that review and revision of nutrient water quality objectives be completed by 2009.

Comment 69

EMWD raised concerns that in the next six months, the proposed objectives or targets would be put into permits. Therefore, they are water-quality objectives. EMWD contends that, since water-quality objectives do not exist, setting a numeric target value should include all of the factors required for establishing water-quality objectives.

Staff Response

See response to Comment 68

As discussed at length in the TMDL report, Section 6 - Linkage Analysis, the proposed numeric targets are used to derive appropriate wasteload and load allocations for all discharges that affect the lakes. This takes into account the nutrient dynamics of the lakes, as they are currently understood, and assumes some transformation of nutrients through the various in-lake processes. Numeric targets would not be specified as discharge limits, but are used to develop the proposed wasteload allocations, which would be implemented through permit limitations. For the recycled water discharges, Board staff assumed discharge quality of 0.5 mg/L phosphorus to meet the interim phosphorus numeric target of 0.1 mg/L; to meet the final proposed numeric target of 0.05 mg/L, recycled water discharges would be limited to 0.2 mg/L. These concentrations are based on assumed discharge volume needed to maintain Lake Elsinore lake elevation and consultant studies on achievable discharge concentrations. For nitrogen, staff assumed a discharge quality of 1 mg/L to meet the proposed interim and final nitrogen targets. Again, the discharge limit is based on consultant studies regarding the nitrogen levels that can be achieved in recycled water.

As stated above, since the proposed numeric targets are not being recommended as water quality objectives, California Water Code requirements (§13241) do not apply. Nonetheless, pursuant to CEQA requirements, the Board is required to take economics into consideration. As part of the TMDL development process and stakeholder meetings, staff has solicited economic information from stakeholders, including EMWD. With respect to the economic impacts, EMWD has indicated that the costs to treat their effluent would be approximately \$37,000,000. Staff notes that as part of the Lake Elsinore Nutrient Removal Study funded by LESJWA and prepared by CH2MHill, chemical phosphorus treatment for both EVMWD and EMWD recycled water would cost approximately \$8,000,000 in construction and capital costs and an additional \$300,000 in annual O&M costs. For biological phosphorus treatment, CH2MHill reports construction and capital costs to be approximately \$20,000,000, with annual O&M cost of

approximately \$300,000. The CH2MHill report also discusses other treatment methods such as wetlands or chemical-physical treatment that could be utilized as well. The report states that treatment costs could be recovered through the sale of reclaimed water. Staff is unclear as to why there is this discrepancy in estimated treatment costs. Staff will continue to work with EMWD and EVMWD to verify recycled water cost projections. The dischargers are also encouraged to research treatment options and costs with other POTW operators within and outside California.

Ron Young
General Manager
Elsinore Valley Municipal Water District
(letter dated June 3, 2004)

Comment 70

Lake Elsinore is unique because it is an eutrophic, ephemeral lake subject to extreme fluctuation in water supply and external and internal nutrient loading due to the desert climate. Because of this unique status, the traditional approach does not adequately portray the necessary requirements or physical conditions that need to be addressed to establish the TMDL. The Regional Board should continue its TMDL hearings and not schedule action until EVMWD's expert analysis is fully reviewed and presented.

Staff Response

Another TMDL workshop at the regular Regional Board meeting on September 17, 2004 is scheduled. No action by the Board will be taken at the September 17th workshop. Elsinore Valley Municipal Water District (EVMWD) will have ample time to present their analysis to the Board. It is worth pointing out that the unique nature of Lake Elsinore is recognized in the proposed TMDL, as reflected both by the 10-year running average approach recommended to judge compliance with the wasteload and load allocations and by the phased nature of the TMDL.

Comment 71

Unlike most lakes, the role of nutrients and thus TMDLs in Lake Elsinore is subordinate to lake level or the climate. Because of their minimal impact, it is unlikely that the TMDLs as proposed will bring any noticeable increase in beneficial uses. However, the lake can be improved without the traditional imposition of more restrictive TMDL values. Other than a stable level target, the only other target needed is that the dissolved oxygen (DO) standard should be raised to 5 mg/L throughout the water column. High benthic DO would reduce fish kills and reduce the release of toxic ammonia. The N, P and chlorophyll-a standards are unrealistically low for a lake with such a high ratio of watershed to lake surface area. These targets would not provide acceptable water clarity or protection from fish kills or algal blooms.

Staff Response:

Staff recognizes the importance of dissolved oxygen and thus has proposed to use it as one of the TMDL numeric targets. However, based on consideration of this comment, staff proposes to revise the DO targets initially recommended. Specifically, as shown below and in the revised proposed Basin Plan amendment, Table 5-9n, the final DO target for Lake Elsinore and the interim DO target for Canyon Lake would be revised to delete references to the 2mg/l concentration goal.

Indicator	Lake Elsinore	Canyon Lake
...		
Dissolved oxygen concentration (Interim)	Depth average no less than 5 mg/L; to be attained no later than 2015	Minimum of 5 mg/L above thermocline and no less than 2 mg/L in hypolimnion; to be attained no later than 2015
Dissolved oxygen concentration (Final)	No less than 5 mg/L 1 meter above lake bottom and no less than 2 mg/L from 1 meter to lake sediment; to be attained no later than 2020	Daily average in hypolimnion no less than 5 mg/L; to be attained no later than 2020.

The Basin Plan specifies that the dissolved oxygen for waterbodies designated WARM, including Canyon Lake and Lake Elsinore, shall not be depressed below 5 mg/L. The Basin Plan does not identify the depth over which compliance with this objective is to be achieved, nor does it reflect seasonal differences that may result in DO variations associated with stratification in the lakes. The revised proposed targets are consistent with the Basin Plan DO objective and take into account the conventional sampling protocol (i.e., dissolved oxygen is measured at 1 m intervals). The revised targets also reflect uncertainty about the efficacy of proposed aeration projects, and about the degree to which nutrient reductions will result in dissolved oxygen increases. As the relationship between nutrient input and dissolved oxygen levels in the lakes is better understood, the TMDL targets for dissolved oxygen will be revised appropriately to ensure protection of aquatic life beneficial uses.

Staff does not agree that only a dissolved oxygen target is needed for Lake Elsinore. While adequate dissolved oxygen concentrations may indeed prevent fish kills, fluctuations in dissolved oxygen levels are directly related to nutrient input. Dissolved oxygen is a response variable intended to assess the overall lake health; however, according to federal law and regulation, the TMDLs must also include targets that are directly related to the “polluting parameters”, in this case phosphorus and nitrogen.

Comment 72

High benthic DO is needed to attain the already agreed upon N and P offsets for import of reclaimed water.

Staff Response

Staff is not aware of any agreed upon offset program. Currently, recycled water is discharged to the lake as part of a pilot project intended to evaluate whether reclaimed water additions are feasible for Lake Elsinore. Permit authorization for the pilot program is scheduled to expire in December, at which time a full assessment of the viability of the continued addition of reclaimed water will be made. [Staff notes that requests to extend the pilot project have been made; continuation of the project would require amendment of the POTW waste discharge requirements at a public hearing.]

Comment 73

The lake model seems to indicate that an increase of water level will be more beneficial than implementation of watershed TMDLs and conversely, that a reduction in water levels will overwhelm any benefits from TMDLs. The issue of a stable and high lake level is not addressed adequately in the TMDL report. A water level of 1246 \pm 1.0 ft msl should be established as a long-term numerical TMDL target. This corresponds to a limnologically more meaningful 26 feet maximum water depth.

Staff Response

The effect of lake levels on water quality in Lake Elsinore was discussed in the TMDL report (sections 2.3, 3.1, and 6). The significance of a high, stable lake level is recognized and was a key consideration in the Regional Board's decision to authorize the recycled water discharge pilot project. A lake level target could be included in the TMDL, but doing so would not obviate the need to identify nutrient load reductions. While lake level affects the impacts of nutrient loads coming into the lake, the nutrients themselves are the cause of algal blooms that contribute to impairment of beneficial uses. As discussed in the TMDL report, staff developed TMDL and allocation schemes that take into account all of the various hydrologic conditions in the watershed and the resulting lake levels.

Comment 74

Improvement in beneficial uses can be achieved by methods, primarily biomanipulation, that are not typically employed by TMDLs. Good water clarity is only achievable with biomanipulation, which requires a stable lake level. Biomanipulation and long-term in-lake TMDL management targets (methods) should be set in place of numerical nitrogen, phosphorus, chlorophyll or Secchi target (concentrations).

Staff Response

As discussed in the staff report (and in the response to Comment 71), federal regulations require the Regional Board to establish quantifiable and measurable numeric targets that will ensure compliance with water quality standards (beneficial uses and water quality objectives). The proposed targets for nitrogen, phosphorus, chlorophyll and dissolved oxygen comply with these regulations. They are measurable water quality parameters that can be used to track the water quality condition of the lakes.

Staff agrees that biomanipulation and other in-lake treatment methods for Lake Elsinore are projects/plans that are important for restoration of Lake Elsinore. They are, however management activities intended to achieve the specific water quality targets. It is staff's opinion that implementation of any of the in-lake treatment programs are not viable long-term solutions unless controls to address future nutrient inputs are taken as well. It is entirely likely that the benefits achieved through the implementation of biomanipulation or calcium treatment could be un-done by 1 year of moderate rainfall and nutrient input.

Comment 75

No targets for in-lake nutrients (N and P) should be set with the exception of the DHS rule of less than 10 mg/L as N for Canyon Lake (protection of drinking water).

Staff Response

See response to Comment 74. TMDL numeric targets must be based on existing water quality standards and ensure protection of all beneficial uses. Studies have shown that phosphorus is an important nutrient that stimulates algal growth in both Lake Elsinore and Canyon Lake (Anderson, 2000, Anderson and Oza, 2003). In addition, un-ionized ammonia concentrations in Lake Elsinore have exceeded ammonia toxicity criteria (US EPA, 1999). In order to control the excessive algal production and prevent ammonia toxicity, nutrient input to the lakes needs to be controlled.

Comment 76

Nitrogen should be defined as biologically available total inorganic nitrogen (TIN) not total nitrogen (TN) (TIN+biologically unavailable organic-N) for in lake targets and lake models.

Staff Response

Staff disagrees. Nutrient cycling in the lakes can be very rapid. Organic nitrogen can be transformed to ammonia, which is bio-available for algae activity. Therefore, TN is a better and more conservative indicator than TIN.

Comment 77

Phosphorus should be defined as either 80% total phosphorus (TP) or bio-available TP.

Staff Response

Staff disagrees. The ratio between bio-available phosphorus to TP varies greatly for the lakes. During storm flows, the ratio can be greater than 80%?. During the summer time, the ratio is much lower in the epilimnion; most of the bioavailable phosphorus is taken-up through algae growth. The P in the hypolimnion is mostly bioavailable phosphorus, due to the sediment release of soluble reactive phosphorus (SRP)². When lakes turn-over and the hypolimnion and epilimnion water mixes, the ratio of bio-available to total phosphorus in the water column becomes uniform again. In addition, research has shown that the relationship between TP and algal uptake rate is stronger than the relationship between SRP and algal uptake rate (Hudson, J. J., Taylor W. D. and Schindler, D. W., "Phosphate Concentrations in Lakes", Nature, Vol. 406, pp 54-56, 2000.) Therefore, TP is a better indicator of lake eutrophic status.

Comment 78

The lake level versus fish kill section should be reconsidered in the light of the lake model now available and with consideration of other opinion.

Staff Response:

Staff does not propose to revise the Technical Report. Certain changes to the recommended TMDLs are being proposed in response to comments. Staff does not believe that this comment warrants any such change.

Staff agrees that the relationship between lake level and fish kills is very complex. The main cause of fish kills has been depletion of oxygen, which is caused by many factors, including algal blooms and climate. The TMDL Technical Report observed that in the

² In most cases the bio-available P is equivalent to the SRP.

1990s (e.g., 1995), several fish kills occurred either after heavy rainfalls that brought significant nutrient runoff to the lake or when the lake levels were very low (e.g., 2002).

Draft Review by Dr. Alex Horne (Memo to Phil Miller, EVMWD, May 24, 2004)

(Note: The review/comments by Dr. Horne were used as the basis for the comments and recommendations submitted by Ronald Young of EVMWD. Only those comments/recommendations not included in the EVMWD letter are presented below, with appropriate responses.)

Comment 79

A more rational ratio of TIN : 80% TP should be used to show if there is a relative shortage of P and N. The reduction of N and P from the watershed requires very different emphasis and technology. The reduction of N and P is best done in parallel with TIN and TP being kept at a constant 10:1 ratio. Use of TN to TP will obscure the balance in the desired ratio and provoke increased growth of blue-green algae.

Staff Response:

Staff now recommends that the TN numeric target be revised based on a TN :TP ratio of 15:1 (see response to Comment 54). Staff does not believe that it is appropriate to use a TIN:80% TP ratio, since nitrogen and phosphorus cycling can be very rapid in the lakes and the ratio of soluble phosphorus to TP varies greatly in the lakes and watershed. See also responses to Comments 76 and 77.

Use of Total N and total P is a better and more conservative representation of nutrient levels. Staff acknowledges that treatments for N and P are quite different. Staff also acknowledges that the understanding of the nitrogen cycle in the lakes is limited, e.g., the amount and rate of N fixed by blue-green algae (cyanobacteria), denitrification, and mineralization.

Comment 80

Algal growth in Lake Elsinore is limited by light and CO₂, not nitrogen or phosphorus, as stated in the draft TMDL.

Staff Response

Lake Elsinore algal biomass (as indicated by chlorophyll a) responded positively with the addition of phosphorus in the lab experiments conducted by Anderson (2001), which indicates that phosphorus is the limiting nutrient at the time. However, as phosphorus concentrations have steadily increased in the last few years, the chlorophyll concentrations have not increased proportional to the increased phosphorus concentrations (the predicted chlorophyll of 595 ug/L vs. the observed chlorophyll a concentrations of 200 ug/L) (Anderson, 2004, personal communication). This suggests that the lake is over-enriched with nutrients (phosphorus and nitrogen) resulting in dense populations of algae that compete for available light. In staff's opinion, the fact that light has become a limiting factor is the direct result of available nutrients that promote excessive algal growth. It is the overabundance of nutrients that needs to be controlled in order to prevent the excessive growth of algae that compete for light. Both phosphorus and nitrogen concentrations must be reduced to control algal blooms effectively.

Comment 81

It is difficult to set nitrogen and *phosphorus* TMDL targets in Lake Elsinore. Rather, the beneficial uses can be achieved by lake management methods such as biomanipulation that requires a relative stable water level.

Staff Response

See response to comment 74.

Comment 82

Fish kills in Lake Elsinore are not clearly related to water depth or to algal blooms. The lack of relationship is critical since the TMDL attempts to control algae blooms via nutrient reductions. There may be other reasons for the TMDL than fish kill reductions.

Staff Response:

The purpose of the TMDL is not simply to control fish kills but to address other impairment of the beneficial uses of the lakes, including the adverse effects of excessive algae growth on recreational uses and the diversity and abundance of the biota. Nutrient controls are a necessary part of a program to address excessive algae growth.

Staff agrees that lake levels do not seem to have a predictable effect on fish kills. Fish kills in Lake Elsinore are caused by low DO, and ammonia toxicity (EIP Associates, Draft Lake Elsinore Fishery Management Plan, 2004). The cause of low DO can be the result of respiration of the tremendous amount of organic debris due to high productivity of the lake, the high oxygen demand of the lake sediment, and extended periods of no wind action in the area. Staff also recognizes the difficulties in correlating low DO and algal blooms. It is generally understood that algal blooms exert high oxygen demand from the respiration of algae, the organic debris, even though the events may not always occur at the same time. In-lake treatments, such as aeration/oxygenation may increase oxygen concentration in the water column without any reduction in nutrient concentrations or algal production.

Gene Rogers
City Manager, City of Moreno Valley
(letter dated June 4, 2004)

Comment 83

The City of Moreno Valley budgets more than \$1.2 million a year for its NPDES storm water program. This includes annual catch basin cleaning, street sweeping, inspection programs, illicit connection and discharge detection, and administration including management and maintenance of extended detention basins and constructed wetlands in new developments. The City is concerned that the model used to develop the proposed TMDLs did not identify the water quality benefits (pollution reductions) derived from our current and past management and pollution control practices.

Staff Response

Regional Board staff recognizes the City's stormwater program commitment, which has likely helped to reduce the pollutant loads to receiving waters. The benefit of the NPDES program in pollutant load reduction has not been quantified for the San Jacinto River watershed. The nutrient source assessment model simulated nutrient loads from land use types in the watershed based on the land use information in 1990s. To the extent that stormwater program implementation by the City and other municipalities in the watershed has resulted in decreases in these loads, then those efforts have forwarded compliance with the proposed TMDLs and wasteload allocations. Implementation of the City's program does not obviate the need to meet those allocations. Monitoring is a requisite component of the proposed TMDL implementation plan. New data collected regarding nutrient loads from different sources, including municipal stormwater, will be used to refine the models, which may lead also to refinement of the TMDLs/wasteload allocations.

Comment 84

Moreno Valley agrees and supports the concept that both lakes be stabilized for recreational uses and benefit of the cities. However, Moreno Valley does not agree with the TMDL model providing a Waste Load Allocation for supplemental water. Moreno Valley believes that the WLA for supplemental water as currently modeled should be allocated to the other land uses. Any assignment of a WLA to supplemental water should be done through pollutant trading with the appropriate stakeholders.

Staff Response

Staff understands the concerns of Moreno Valley that a WLA for supplemental water means less TMDL allocation available to other sources. The proposed inclusion of a WLA for recycled water input to Lake Elsinore reflects the reality that this supplemental water is likely to be necessary under certain conditions to prevent the lake from drying out, or at least to maintain a stable lake level. The TMDL Technical Report and comments from other parties emphasize the significant effects of lake level on water quality and beneficial uses. Obviously, beneficial uses are particularly impacted when the lake dries out. The proposed inclusion of a WLA also takes into account substantial efforts by the City of Lake Elsinore and Elsinore Valley Municipal Water District to identify a reasonable balance between quantity and quality issues, leading to the Regional Board's authorization of a pilot recycled water discharge project. The inclusion of a WLA for the recycled water would forward efforts to identify and implement solutions to the water quality and quantity problems confronting the Lake.

Comment 85

Moreno Valley is concerned that the City was identified to address nonpoint source pollution. Pursuant to 40 CFR 130.2 (p), the State is responsible for funding measures to implement load allocations assigned to nonpoint sources.

Staff Response

The City appears to be referring to a version of regulations that never came into effect. The 2000 regulations were adopted by the Clinton administration, but Congress barred enforcement and the Bush administration withdrew them. There is no section 130.2(p) in title 40 of the CFR. The regulations that currently apply are those that were issued in 1985 and amended in 1992 (40 CFR Part 130, Section 130.7).

Municipalities, such as Moreno Valley, are co-permittees of the stormwater NPDES (MS4) permit. This permit regulates urban runoff, including stormwater, as a point source. Therefore, the urban component was properly assigned WLAs.

Comment 86

Moreno Valley requests that the total atmospheric deposition be calculated for the entire watershed, removed from the other land uses and included as a LA in the model.

Staff Response

The nutrients from atmospheric deposition on the watershed enter the lakes via runoff and are accounted for in the load and waste load allocations. If the atmospheric deposition over the watershed received a LA, it would greatly reduce the share of the TMDL (LA and WLA) given to other sources.

Paul Lambert
District 8 NPDES Storm Water Coordinator, California Department of Transportation
(letter dated June 4, 2004)

Comment 87

Our main concern is that this TMDL would require construction of treatment controls, not yet developed; however the benefit has not been demonstrated to justify the cost.

Staff Response

The Regional Board is required by law to establish TMDLs for waters that do not meet water quality standards, which include beneficial uses and water quality objectives. The economic feasibility to the dischargers of achieving the standards is neither relevant nor authorized when setting the TMDLs. As explained in the TMDL report, the costs of the methods of compliance must be considered by the Regional Board as part of the CEQA process for the proposed Basin Plan amendment. This does not require a cost/benefit analysis. Board staff would welcome information from the Department concerning the expected costs of anticipated methods of compliance.

Comment 88

The historical records show that the beneficial uses for Lake Elsinore have not been maintained continuously, e.g., during the drought of 1950s-1960s when the lake completely dried out. So even with the nutrient control measures, the beneficial uses are not protected.

Staff Response

Regional Board staff recognizes that when Lake Elsinore dries out, beneficial uses are not protected. This does not obviate the need to take appropriate steps to protect beneficial uses when water is present.

Comment 89

The Department is concerned to see that an allowable phosphorus concentration of 0.5 mg/L be allowed for recycled water that will be used to maintain lake level. The proposed TMDL indicates that the stormwater runoff have an ultimate concentration of 0.05 mg/L. It is unreasonable to expect that the currently available technology used for stormwater treatment could possibly achieve this level of performance. The TMDL has not shown the cost and the benefit of the treatment.

Staff Response

Please see the response to Comment 2 by the Riverside County Flood Control and Water Conservation District. The proposed TMDLs have phosphorus targets for the lake. No concentration limits are proposed for the urban runoff. As indicated in the response to the Department's first comment, it is not appropriate to consider economics when establishing the TMDLs.

Comment 90

The proposed Total Nitrogen targets are more stringent than the Basin Plan Objectives for Total Inorganic Nitrogen (TIN).

Staff Response

The TIN objective in the Basin Plan for Canyon Lake was established for drinking water protection from nitrate toxicity. It was not established to control excessive algal growth. Similarly, it is evident that the established objective for Lake Elsinore is not adequate. Both lakes have shown high ammonia concentrations, which have exceeded the ammonia toxicity criteria. Controlling total nitrogen may reduce algal biomass and thus reduce ammonia concentration.

Comment 91

The Department is concerned that there is a need to consider the cumulative cost and technical implications of these TMDLs combined with future TMDLs. The concern is that the cost for these TMDLs may be fundable but the full set of TMDLs may be far beyond available resources. Another concern is that the controls to implement this TMDL may not be compatible with the controls to implement future TMDLs. A watershed approach is needed that examines and prioritizes the overall water quality needs and assess the financial feasibility of achieving these goals.

Staff Response

Regional Board staff understands the concerns expressed. The fact that the nutrient TMDLs are now being considered, rather than other TMDLs required in the San Jacinto River watershed, reflects the high priority assigned to this source of impairment. Board staff work on other requisite TMDLs (pathogen TMDL for Canyon Lake, unknown toxicity and possibly, sediment TMDLs for Lake Elsinore) will make every effort to assure consistency and complementary, rather than redundant, requirements. As previously stated, federal law mandates that the Board adopt TMDLs that address impairment of water quality standards irrespective of financial feasibility. The proposed TMDLs include 10 and 15-year compliance schedules in part to allow responsible parties to identify and implement funding and technical solutions.

Comment 92

The Department is willing to partner with municipalities and other agencies on a pro rata basis to implement measures that are technologically feasible and justifiable economically. The Department facilities in the watershed are not a major source of nutrients contributing to the impairment of the lakes. Limiting use of chemicals in the agricultural practices within the watershed may be more effective in improving water quality of the lakes.

Staff Response

Regional Board staff appreciates the willingness of the Department to work on these TMDLs and certainly encourages the cooperative, multi-agency approach favored by the Department to identify technically sound and cost-effective measures. The Regional Board is required to identify all sources of nutrients contributing to the lakes, including agriculture and runoff. To the extent that agricultural practices can be more effective in achieving or exceeding the nutrient reductions required by the proposed load allocations, trading of nutrient input credits to the Department may be feasible.

**Peer Review Comments from Dr. Michael Josselyn
(Received July 30, 2004)**

Comment 93

Dr. Josselyn concurred with the finding that phosphorus is the limiting nutrient for both lakes and that controlling this nutrient will have the most substantial influence on algal growth in the water column. Dr. Josselyn suggested that it may be more appropriate to propose a TMDL for ammonia rather than for nitrogen to reduce potential ammonia toxicity.

Staff Response

The proposed targets in the Lake Elsinore and Canyon Lake TMDLs shown in the draft Basin Plan amendment presented at the workshop on June 4, 2004 included phosphorus, nitrogen, chlorophyll a and Dissolved Oxygen. Ammonia targets, discussed in the May 21, 2004 Technical Report, were inadvertently omitted from the proposed Basin Plan amendment. This oversight has been corrected in the revised amendment.

While phosphorus has been the limiting nutrient for Lake Elsinore in recent years, nitrogen can be the limiting nutrient for Lake Elsinore and Canyon Lake temporally and spatially. In order to control algal growth, staff proposes to control both nutrients.

Comment 94

Dr. Josselyn concurred with the statements that Lake Elsinore may be naturally eutrophic. He indicated that the targets for phosphorus as proposed reflect both the "natural" eutrophic nature of Lake Elsinore, the reality of high levels of phosphorus regeneration from the sediments, and the practicalities of trying to treat sediment in-situ. Dr. Josselyn stated that the shallow nature of the lake leads to wind re-suspension, a major source of phosphorus regeneration that cannot be controlled. Dr. Josselyn expressed the concern that the proposed reduction levels for phosphorus in Lake Elsinore rely significantly on proposals (aeration, alum treatments) that have not been tested for their effectiveness in this particular situation. Dr. Josselyn stated that given the seasonal stratification that occurs in Canyon Lake, he agrees that reduction in loading from external sources would be more effective in controlling phosphorus levels.

Staff Response

Staff proposes an implementation task to evaluate the in-lake treatment options to reduce internal nutrient loading from Lake Elsinore and to identify a plan/schedule for implementation of one or more strategies. (A task is also proposed for sediment nutrient treatment evaluation in Canyon Lake.) LESJWA has already conducted relevant studies in Lake Elsinore. The proposed treatment options include wetland treatment, aeration, metal salt addition and supplemental water for the lake. The compliance schedules proposed for the TMDLs allow assessment of the efficacy of these options. Where found necessary, changes to the TMDLs and implementation strategies can be considered.

At the present time, staff is not able to quantify the effect of nutrients from wind re-suspension on Lake Elsinore water quality, because the lake seems to have an active sedimentation process. Increase of the lake depth, and removal of carp should reduce the amount of nutrients released from sediment re-suspension.

Comment 95

Chlorophyll levels for Lake Elsinore appear to be appropriately estimated from proposed P concentrations and from other TMDLs in eutrophic lakes. Dissolved oxygen levels are appropriate for aquatic life.

Staff Response

Comments noted.

Comment 96

If oxygen levels can be maintained at higher levels (which are also directly related to eutrophic conditions) the targets could protect freshwater aquatic habitat and water and non-contact water recreation (the beneficial uses cited as impaired by the nutrient levels). It is not clear how other compounds or physical factors (high temperature, stratification) capable of having toxic effects on fish are playing a role in fish kills. However, personal observations at both lakes support a conclusion that excessive algal growth is a significant factor affecting both fisheries and human water contact. Therefore, the standards proposed for phosphorus should be most appropriate for controlling algae growth.

Staff Response

Comments noted.

Comment 97

The studies by Anderson (2001) and Anderson and Oza (2003) of internal nutrient sources are well documented and employ highly defensible scientific methods and analyses. A simulation model was used to evaluate external sources and staff noted that additional data will be needed to calibrate the model in wet years. Given that staff statement, Dr. Josselyn concurs that using the LSPC model to make estimates is the best approach available at this time.

Staff Response

Comments noted.

Comment 98

Dr. Josselyn stated that the averaging approach is a practical way to address the flood frequency and the variable nutrient loads associated with the floods. However, given that external loading is often only a factor during wet years, it may be more desirable to set loading criteria on the wet year source model results.

Staff Response

Model-simulated annual external nutrient loads to the lakes are shown in Table 5-9 of the May 21, 2004 Technical Report. While the estimated contributions from wet years substantially exceed those during dry and moderate conditions, it is appropriate to require that measures be implemented to control inputs under all conditions.

Comment 99

The nutrient mass balance models used are relatively simple and probably appropriate for Lake Elsinore, a terminal lake. Dr. Josselyn indicated that he did not have an opinion about the appropriateness of the model for Canyon Lake.

Staff Response

Comments noted.

Comment 100

The proposed targets rely heavily on controls for internal nutrient cycling for Lake Elsinore that may not be achievable for practical and methodological reasons. The staff need to demonstrate that such technologies as suggested could actually work in this system. Otherwise, further reductions in external loadings may be required. Other options for controls on release of water from Canyon Lake in wet years should be explored, such as wetland treatment ponds.

External source controls for Canyon Lake are clearly explained and the methods for affecting them are better known and available.

Staff Response

Staff relied on the limnocosm results that evaluated various in-lake treatment options. Staff acknowledges that further testing or pilot projects are necessary to test whether these technologies will work for Lake Elsinore. Staff also proposed such data gathering in the proposed implementation tasks. The TMDL will be reviewed and refined in future based on additional data collection and analyses. The proposed compliance schedules allow this additional evaluation to occur.

Comment 101

Until additional data can be developed for wet years, the weighted average external nutrient load capacity approach is the most practical. Dr. Josselyn noticed that the most significant source of nitrogen and phosphorus to Lake Elsinore during wet years is export from Canyon Lake. Therefore, source control would be much more difficult given sediment concentrations in Canyon Lake that might be re-suspended during a wet year event. The proposed sediment dredging for Canyon Lake might reduce this potential loading source to some unknown degree.

Staff Response

Staff agrees with Dr. Josselyn's suggestion that the proposed dredging might reduce this potential loading source. Task 9 of the proposed implementation plan requires that the stakeholders evaluate the effectiveness of various sediment treatment options in Canyon Lake. Dredging is certainly an option.

Comment 102

The methodology used to derive the WLAs and LAs is a standard approach used in other TMDLs. It is appropriate to specify the allocations as 10-year running averages, since this period would capture the various hydrologic events ranging from dry to wet years. Given the potential variation from year to year and the difficulty of regulating on a year-to-year basis, the weighted average method is the most practical approach to specifying the allocations.

Staff Response
Comments noted.

Comment 103
The margin of safety is incorporated in the conservative assumptions made throughout the analysis. The critical conditions are identified and addressed appropriately in the staff report.

Staff Response
Comments noted.

Comment 104
In response to the question posed by Regional Board staff regarding the need for additional implementation elements or studies to fill in data gaps and fine tune the TMDLs, Dr. Josselyn responded that the most important will be calibration of the LSPC model with actual conditions during wet years. Dr. Josselyn notes that Board staff proposes to continue to collect data and to adjust the standards as these data become available.

Staff Response
Comments noted.

David Smith
TMDL Team Leader
US Environmental Protection Agency Region IX
(letter dated June 3, 2004)

Comment 105

Mr. Smith urged the Regional Board to promptly adopt these TMDLs, consistent with the State's commitment in the State-EPA Performance Partnership Agreement to submit final TMDLs for these waters for EPA approval by 2005.

Staff Response

Comment noted. Staff has scheduled the second public workshop for the September 17, 2004 Regional Board meeting, and the public hearing for Regional Board consideration of the proposed TMDLs is tentatively scheduled for the December 17, 2004 Board meeting. Therefore, barring unforeseen circumstances, these TMDLs should be delivered to US EPA in mid-2005.

Comment 106

We have been working with Santa Ana RWQCB for several years on these TMDLs for Lake Elsinore and Canyon Lake. We have reviewed and commented throughout the TMDL development and implementation planning process.

Staff Response

Comment noted. Board staff have forwarded draft technical reports to our TMDL liaison, Dr. Peter Kozelka, for comments and review and have incorporated the informal and technical comments into the May 2004 TMDL Report. Dr. Kozelka has also participated in stakeholder meetings via teleconferences and answered questions from local stakeholders on relevant TMDL issues. His assistance and input to Regional Board staff has been vital to the development of the proposed TMDLs.

Comment 107

Mr. Smith stated that the beneficial uses of both Canyon Lake and Lake Elsinore have been impaired due to excessive nutrient input, and hopes that the Santa Ana Regional Board will take action to begin to restore the water quality in the lakes and meet all designated beneficial uses. Mr. Smith reminded Regional Board of its legal obligation, pursuant to the Clean Water Act and federal regulations (40 CFR 130.7(c)) to establish TMDLs for 3030 (d) listed waters.

Staff Response

Comment noted.

Comment 108

The TMDLs and Basin Plan amendment define interim and final numeric targets that are consistent with the existing applicable water quality objectives for Lake Elsinore and Canyon Lake. EPA's review of the proposed TMDLs indicate that they meet all federal regulatory requirements and will be approvable upon submittal to EPA.

Staff Response

Comment noted.

Comment 109

Mr. Smith strongly supported the Regional Board's proposal to define the TMDLs and allocations in terms of annual mass loads. This approach is technically appropriate given the long nutrient residence time in lakes and reservoirs and the fact that nutrient loads vary substantially from year-to-year due to variability in inflows to each lake.

Staff Response

Comment noted.

Comment 110

Mr. Smith believes that the Regional Board staff have developed flexible TMDLs using the best available information to date. The Basin Plan amendment outlines short- and long-term plans to address monitoring needs and improved hydrologic modeling. Mr. Smith stated that the implementation plan proposed by the staff included compliance schedules that are reasonable and provided adequate time for meeting the interim and final targets. Mr. Smith recommended that pH monitoring of lake water column be included to elucidate ammonia concentrations relative to the water quality objective.

Staff Response

Staff have revised the Basin Plan amendment to include pH as one of the monitoring parameters for the proposed lake monitoring program (see Attachment A, Task 3).

Comment 111

Mr. Smith commends staff for developing a reasonable TMDL plan that is consistent with federal requirements and will likely result in timely attainment of water quality objectives in these water bodies. It is vital for the Regional Board to adopt this amendment without delay and proceed to begin implementing measures to attain water quality standards.

Staff Response

Comment noted.